

## 11.4 Audit Sample Results.

11.4.1 Calculate the audit sample concentrations in mg/dscm and submit results using the instructions provided with the audit samples.

11.4.2 Report the results of the audit samples and the compliance determination samples along with their identification numbers, and the analyst's name to the responsible enforcement authority. Include this information with reports of any subsequent compliance analyses for the same enforcement authority during the 30-day period.

11.4.3 The concentrations of the audit samples obtained by the analyst shall agree within 5 percent of the actual concentrations. If the 5 percent specification is not met, reanalyze the compliance and audit samples, and include initial and reanalysis values in the test report.

11.4.4 Failure to meet the 5 percent specification may require retests until the audit problems are resolved. However, if the audit results do not affect the compliance or non-compliance status of the affected facility, the Administrator may waive the reanalysis requirement, further audits, or retests and accept the results of the compliance test. While steps are being taken to resolve audit analysis problems, the Administrator may also choose to use the data to determine the compliance or noncompliance status of the affected facility.

## 12.0 Data Analysis and Calculations

Carry out calculations retaining at least one extra significant figure beyond that of the acquired data. Round off figures after final calculation.

12.1 Nomenclature. Same as Method 5, Section 12.1, with the following additions and exceptions:

$C_a$  = Actual concentration of  $SO_2$  in audit sample, mg/dscm.

$C_d$  = Determined concentration of  $SO_2$  in audit sample, mg/dscm.

$C_{H_2SO_4}$  = Sulfuric acid (including  $SO_3$ ) concentration, g/dscm (lb/dscf).

$C_{SO_2}$  = Sulfur dioxide concentration, g/dscm (lb/dscf).

$N$  = Normality of barium perchlorate titrant, meq/ml.

$RE$  = Relative error of QA audit sample analysis, percent

$V_a$  = Volume of sample aliquot titrated, 100 ml for  $H_2SO_4$  and 10 ml for  $SO_2$ .

$V_{soln}$  = Total volume of solution in which the sample is contained, 250 ml for the  $SO_2$  sample and 1000 ml for the  $H_2SO_4$  sample.

$V_t$  = Volume of barium standard solution titrant used for the sample, ml.

$V_{tb}$  = Volume of barium standard solution titrant used for the blank, ml.

12.2 Average Dry Gas Meter Temperature and Average Orifice Pressure Drop. See data sheet (Figure 8-2).

12.3 Dry Gas Volume. Same as Method 5, Section 12.3.

12.4 Volume of Water Vapor Condensed and Moisture Content. Calculate the volume of water vapor using Equation 5-2 of Method 5; the weight of water collected in the impingers and silica gel can be converted directly to milliliters (the specific gravity of water is 1 g/ml). Calculate the moisture content of the stack gas ( $B_{ws}$ ) using Equation 5-3 of Method 5. The NOTE in Section 12.5 of Method 5 also applies to this method. Note that if the effluent gas stream can be considered dry, the volume of water vapor and moisture content need not be calculated.

12.5 Sulfuric Acid Mist (Including  $SO_3$ ) Concentration.

$$C_{H_2SO_4} = K_3 [N (V_t - V_{tb}) (V_{soln}/V_a)] / V_{m(std)} \quad \text{Eq. 8-1}$$

Where:

$K_3 = 0.04904$  g/meq for metric units,

$K_3 = 1.081 \times 10^{-4}$  lb/meq for English units.

## 12.6 Sulfur Dioxide Concentration.

$$C_{SO_2} = K_4 [N (V_t - V_{tb}) (V_{soln}/V_a)] / V_{m(std)} \quad \text{Eq. 8-2}$$

Where:

$K_4 = 0.03203$  g/meq for metric units,

$K_4 = 7.061 \times 10^{-5}$  lb/meq for English units.

12.7 Isokinetic Variation. Same as Method 5, Section 12.11.

12.8 Stack Gas Velocity and Volumetric Flow Rate. Calculate the average stack gas velocity and volumetric flow rate, if needed, using data obtained in this method and the

equations in Sections 12.6 and 12.7 of Method 2.

12.9 Relative Error (RE) for QA Audit Samples. Same as Method 6, Section 12.4.

## 13.0 Method Performance

13.1 Analytical Range. Collaborative tests have shown that the minimum detectable limits of the method are  $0.06 \text{ mg/m}^3$  ( $4 \times 10^{-9}$

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lb/ft<sup>3</sup>) for H<sub>2</sub>SO<sub>4</sub> and 1.2 mg/m<sup>3</sup> ( $74 \times 10^{-9}$  lb/ft<sup>3</sup>) for SO<sub>2</sub>. No upper limits have been established. Based on theoretical calculations for 200 ml of 3 percent H<sub>2</sub>O<sub>2</sub> solution, the upper concentration limit for SO<sub>2</sub> in a 1.0 m<sup>3</sup> (35.3 ft<sup>3</sup>) gas sample is about 12,000 mg/m<sup>3</sup> ( $7.7 \times 10^{-4}$  lb/ft<sup>3</sup>). The upper limit can be extended

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by increasing the quantity of peroxide solution in the impingers.

*14.0 Pollution Prevention. [Reserved]*

*15.0 Waste Management. [Reserved]*

*16.0 References*

Same as Section 17.0 of Methods 5 and 6.